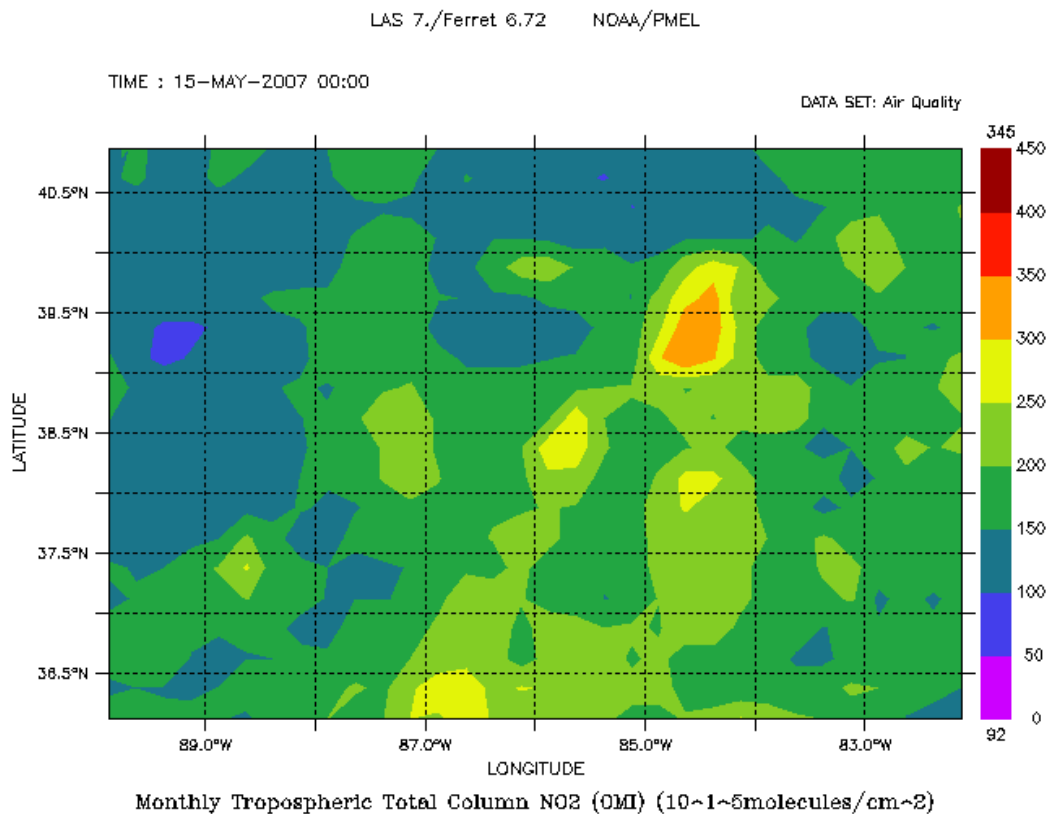
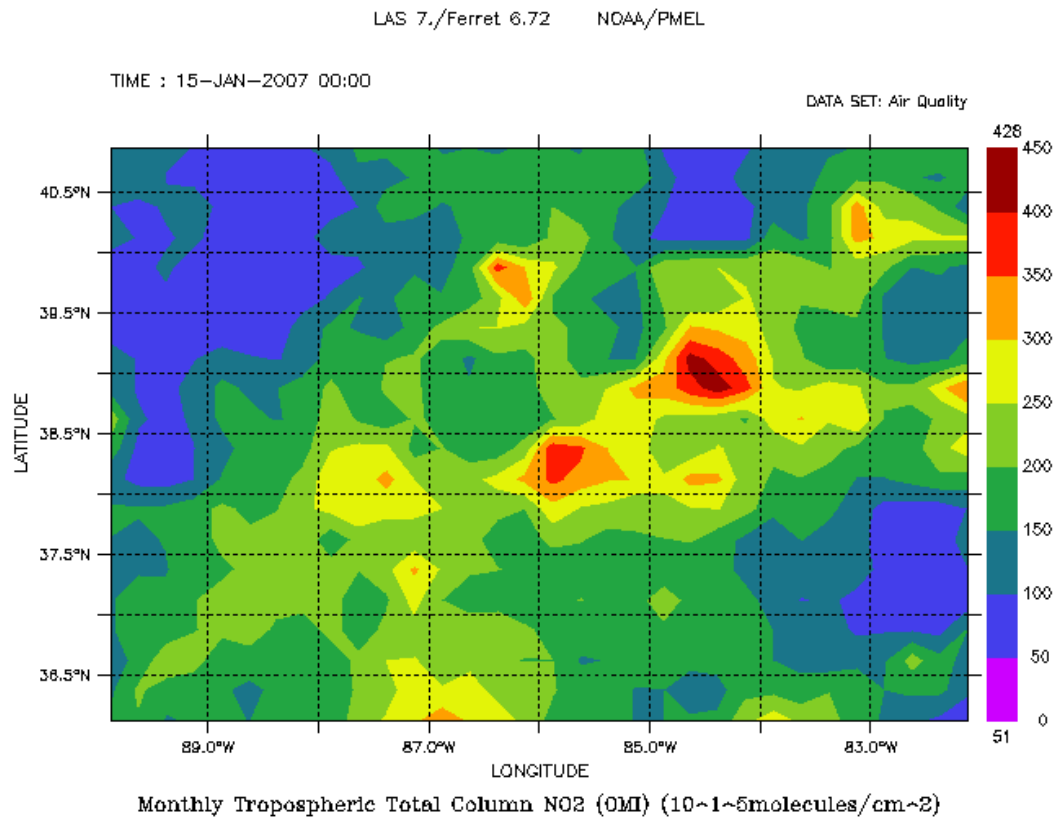
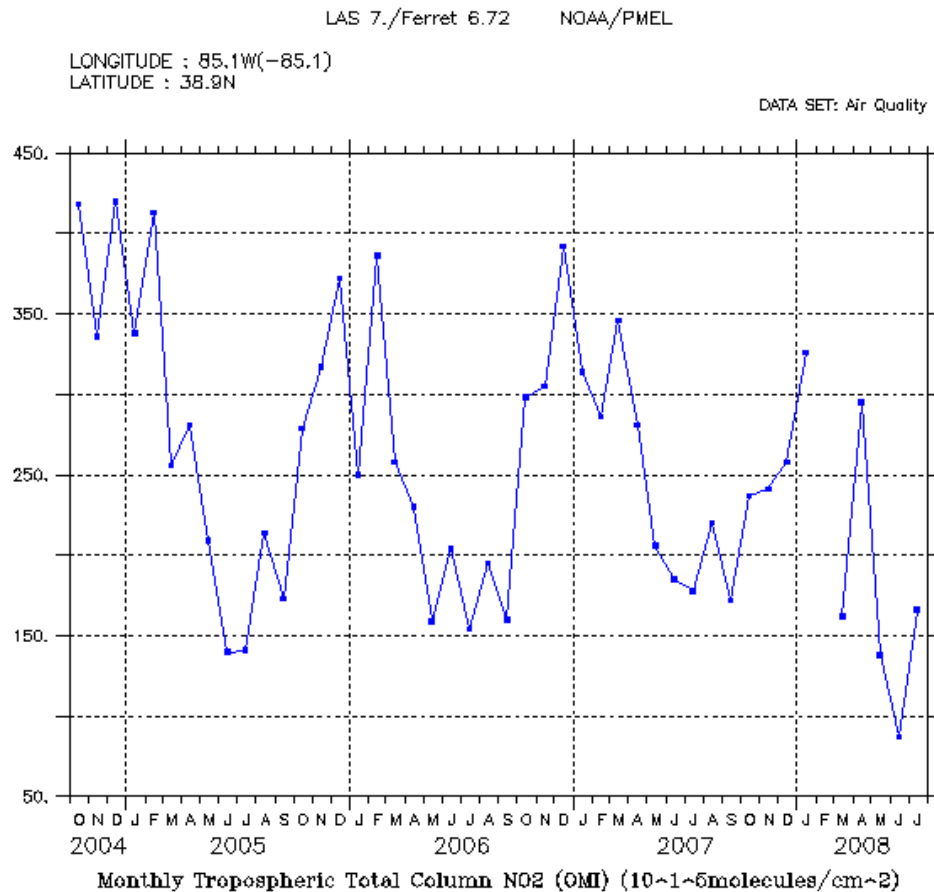


Investigating Seasonal Variability in NO2 Concentrations

Part I Plots



Time Series Plot, graphed in LAS (*graph in Excel should look similar*)



Part I Questions:

1. What observations can be made about the plots? Explain your observations.

Looking at the scale for the plots, it appears there are more dark red contours in the January plot, indicating higher concentrations of NO₂ in January than in May.

2. Why do you think the plots for these two months look the way they do?

Answers will vary.

3. What seasons occur during these two months?

January plot is Northern Hemisphere Winter, May plot is Northern Hemisphere Summer.

4. Given the similarities and differences in seasons, are the similarities what you expected?

Example- Students may think NO₂ would be high in summer due to warmer air temperatures or additional car traffic.

5. Speculate why you think this location was chosen.

Example- Location is close to Cincinnati, a major metropolitan area.

6. Predict how the data would behave if you were to graph a time series for a single location within this area.

Answers will vary.

Part II Questions:

1. Describe any patterns you observe in the graph. Based on your answer from Part I question 7, does the graph look like what was predicted? If not, what was different?

Answers will vary.

2. List possible reasons why the graph appears the way it does from January 2006 to June 2007.

Example- Students may relate NO₂ values to various sources such as car emissions or emissions from factories. Students should also note responses related to the chemical makeup of NO₂. NO₂ photosynthesizes into ozone. Refer students to the diurnal cycle graph of NO₂ and O₃. Notice how NO₂ concentrations decrease as sunlight is strongest. Similarly, more NO₂ is present during winter than summer because of differences in sunlight.